OIPE JC73
JAN 25 2005
PATENT & TRADEMARK

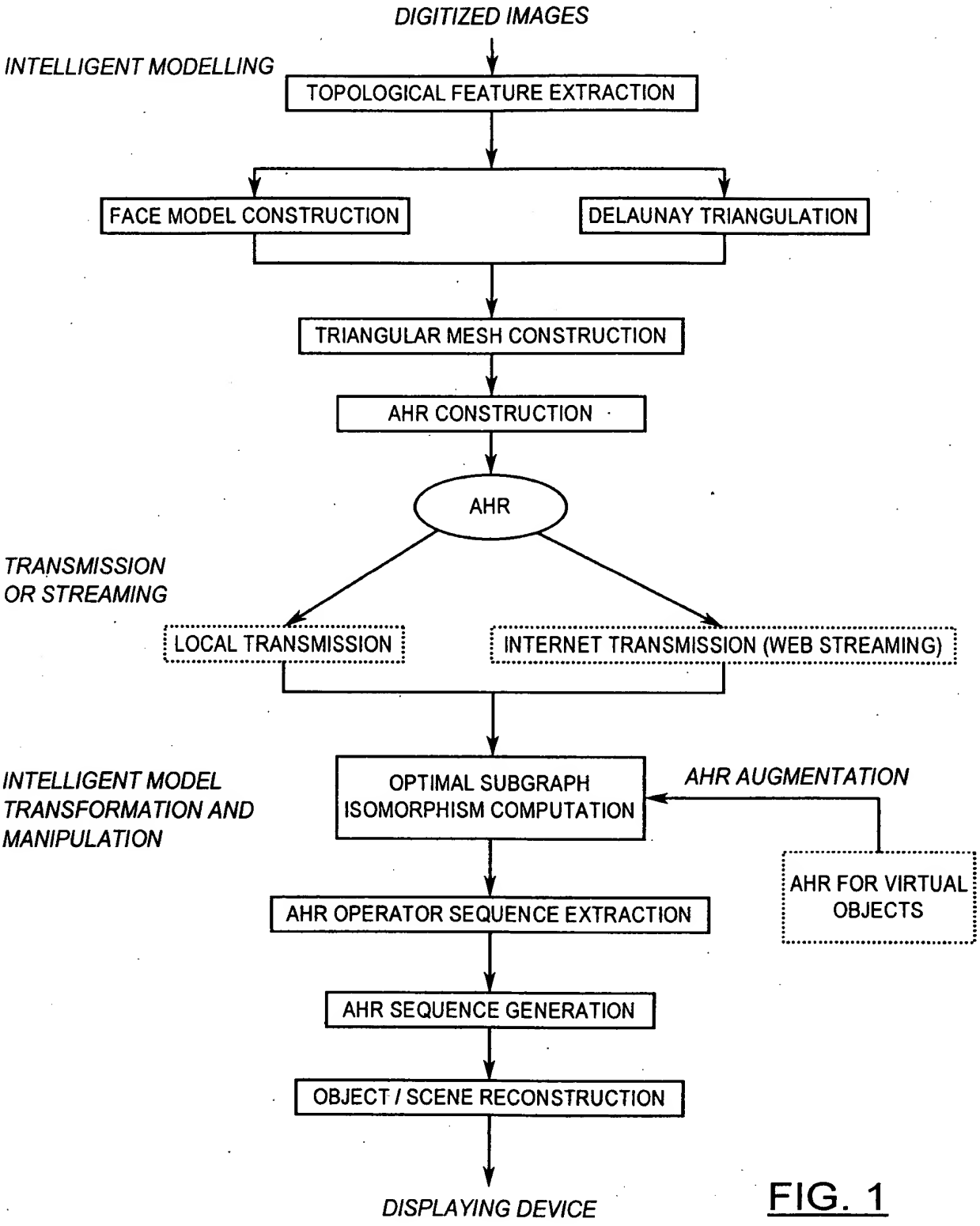


FIG. 1

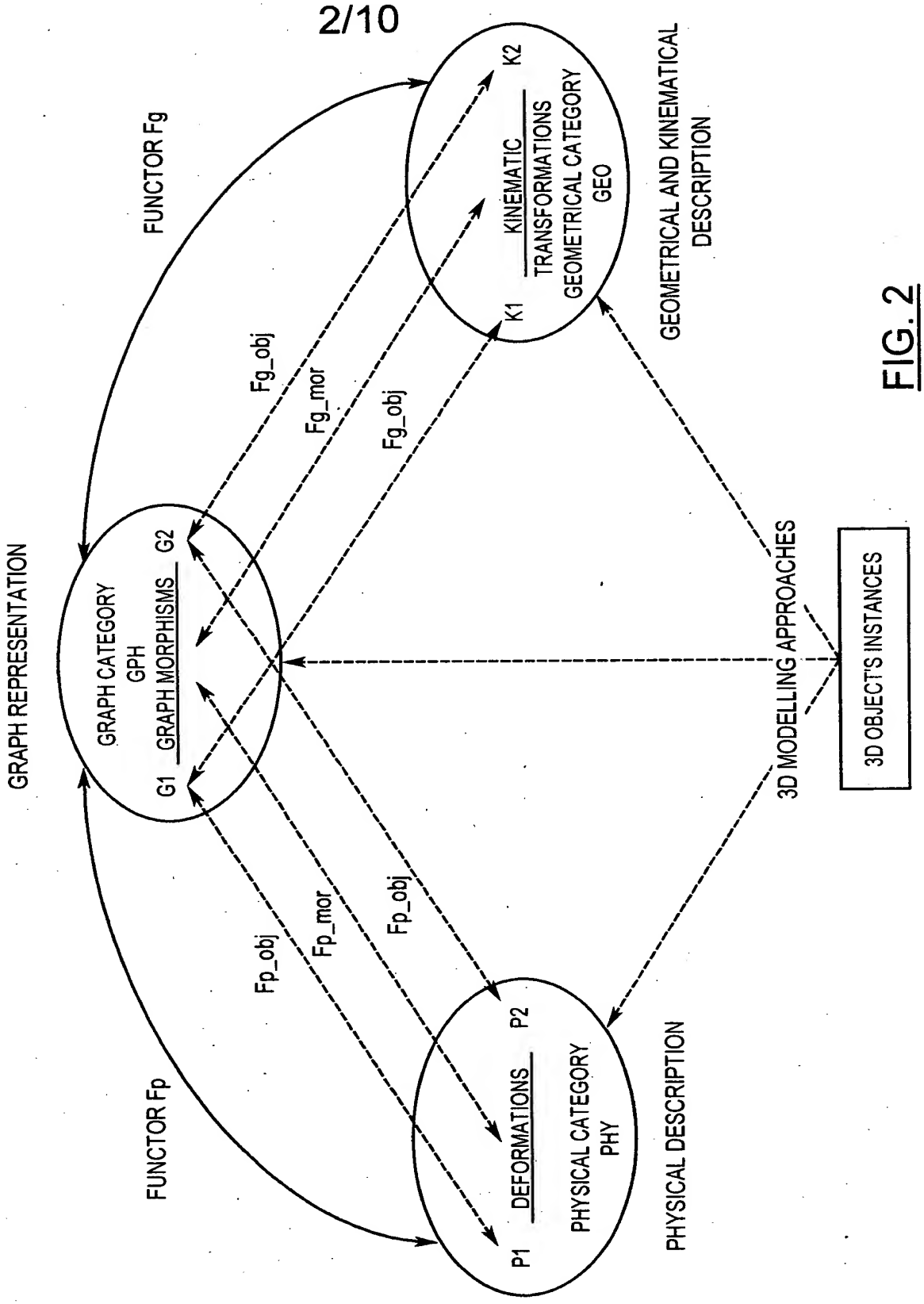

GRAPH REPRESENTATION
FUNCTOR Fg
FUNCTOR Fp
GRAPH CATEGORY
GPH
G1 GRAPH MORPHISMS G2
KINEMATIC
TRANSFORMATIONS
GEOMETRICAL CATEGORY
GEO
K1 K2
PHYSICAL CATEGORY
PHY
P1 DEFORMATIONS P2
Fg_obj
Fg_mor
Fg_obj
Fp_obj
Fp_mor
Fp_obj
GEOMETRICAL AND KINEMATICAL
DESCRIPTION
PHYSICAL DESCRIPTION
3D MODELLING APPROACHES
3D OBJECTS INSTANCES

FIG. 2

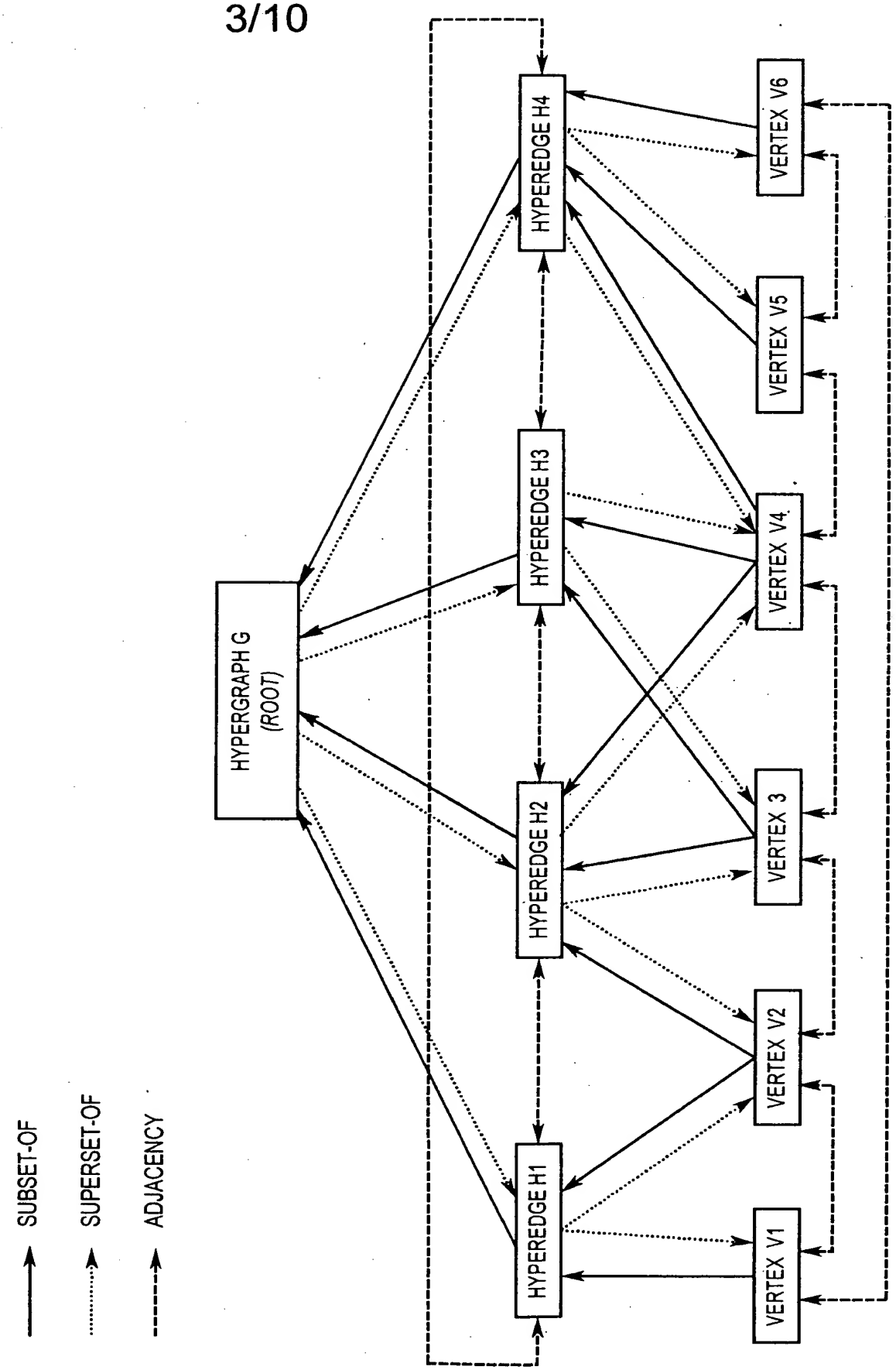

SUBSET-OF
SUPERSET-OF
ADJACENCY
HYPERGRAPH G
(ROOT)
HYPEREDGE H1
HYPEREDGE H2
HYPEREDGE H3
HYPEREDGE H4
VERTEX V1
VERTEX V2
VERTEX 3
VERTEX V4
VERTEX V5
VERTEX V6

FIG. 4

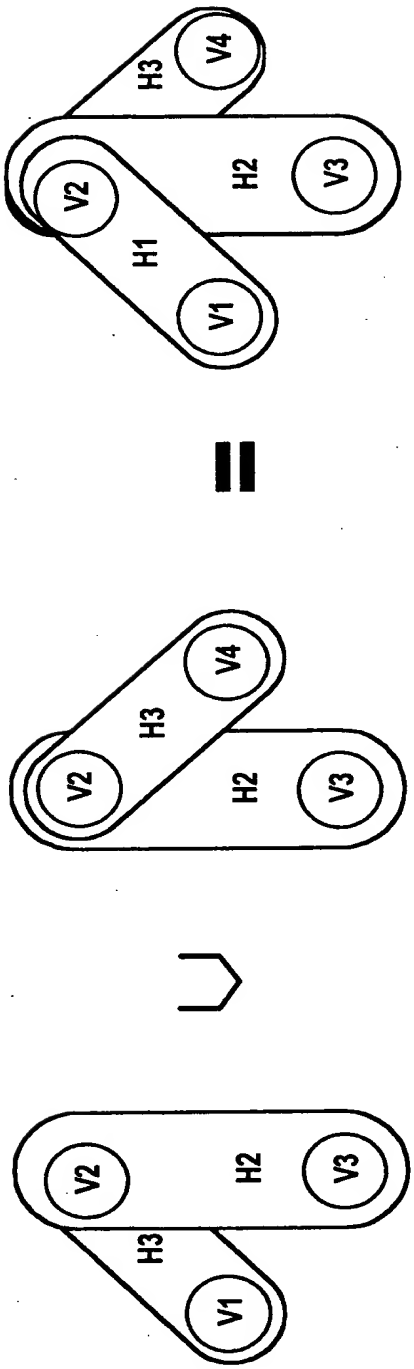

V4
H3
V2
H2
V3
H1
V1
V4
H3
V2
H2
V3
V2
H3
V1
H2
V3

FIG. 5a

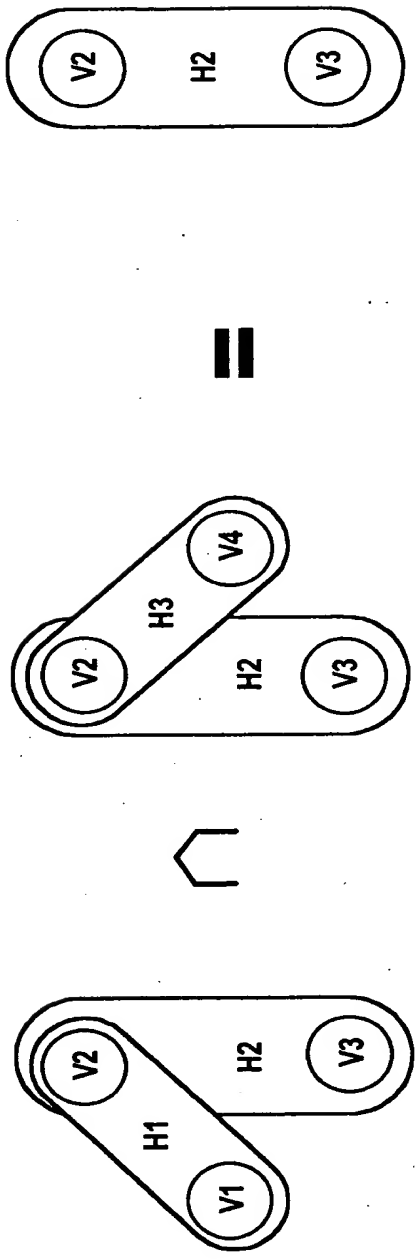
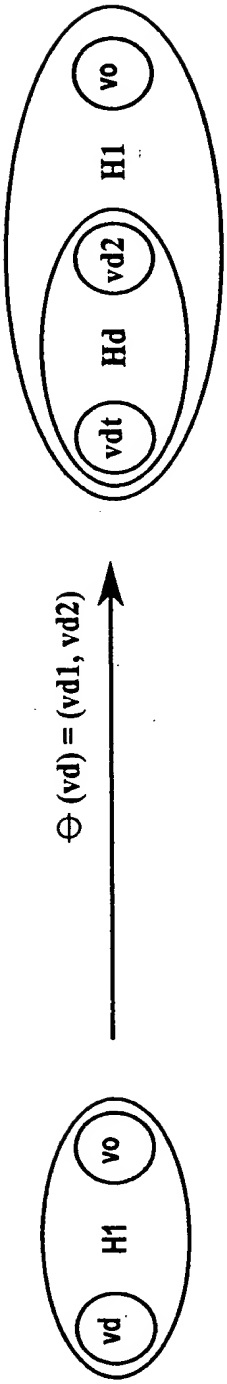
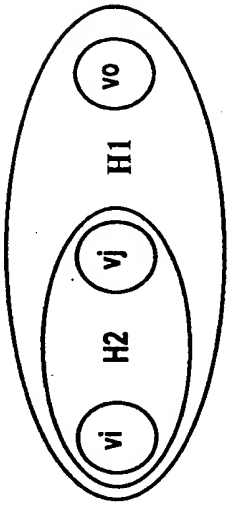

V2
H2
V3
V4
H3
V2
H2
V3
V2
H1
V1
H2
V3

FIG. 5b



Θ (vd) = (vd1, vd2)

FIG. 6(a)



$\oplus$(vi, vj) = vm

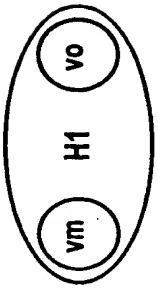
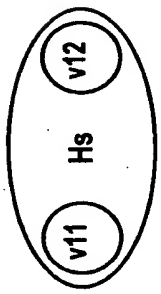


FIG. 6(b)



$\wedge$ (Hs) = Hs1, Hs2)

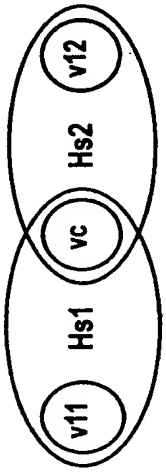
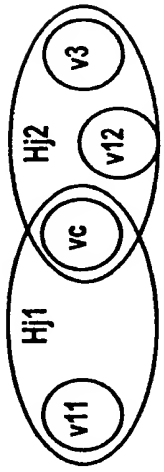


FIG. 6(c)



V (Hj1, Hj2) = Hj

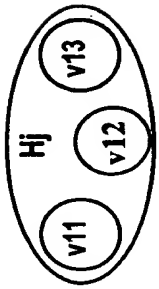
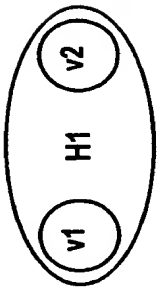


FIG. 6(d)



fa (A_{H1}) = A_{H2}

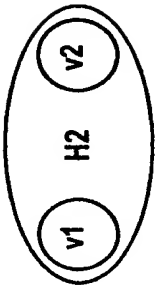


FIG. 6(e)

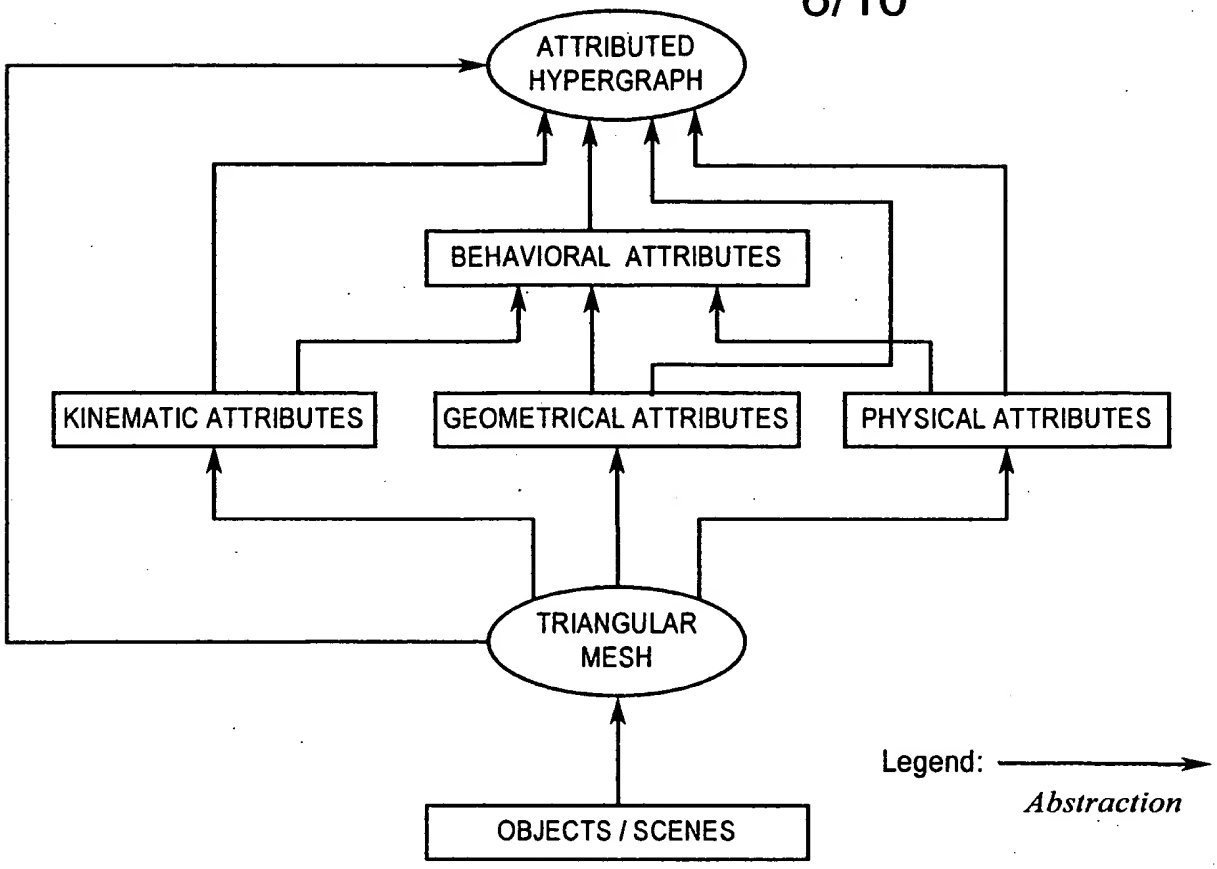

ATTRIBUTED HYPERGRAPH
BEHAVIORAL ATTRIBUTES
KINEMATIC ATTRIBUTES
GEOMETRICAL ATTRIBUTES
PHYSICAL ATTRIBUTES
TRIANGULAR MESH
OBJECTS / SCENES
Legend:
Abstraction

FIG. 7

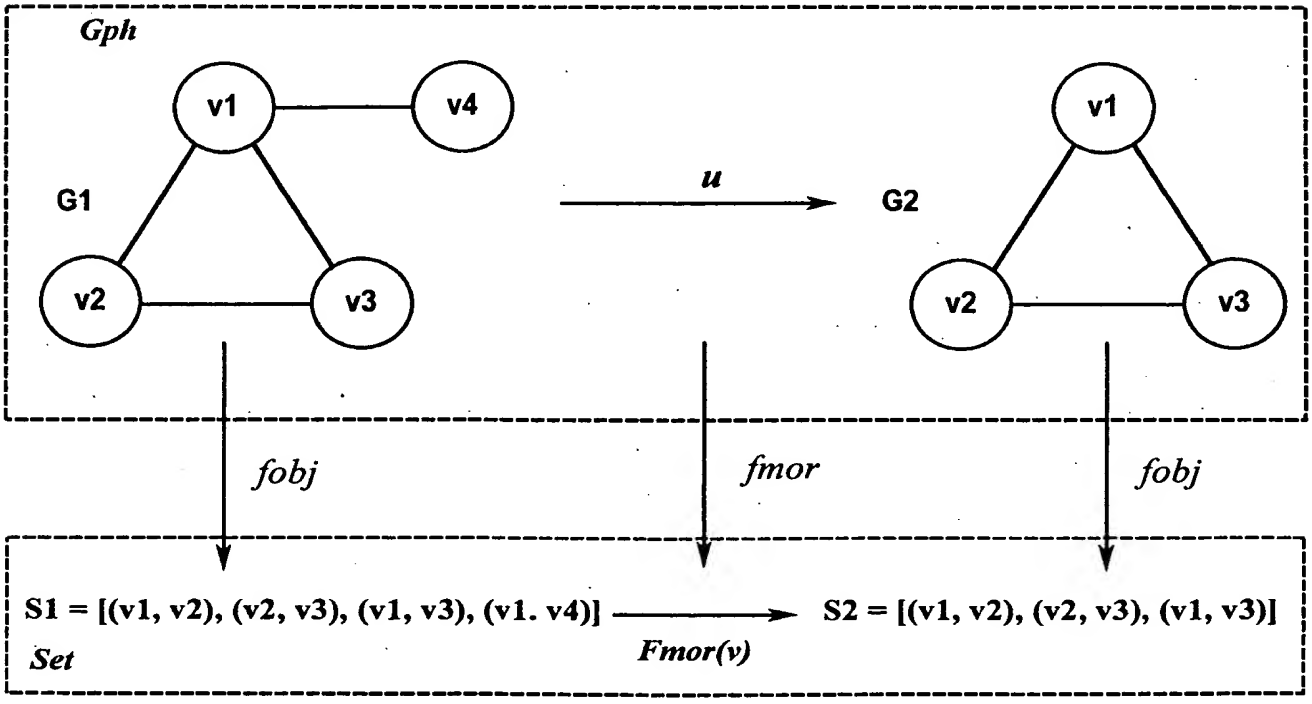

Gph
v1
v4
G1
v2
v3
u
G2
v1
v2
v3
fobj
fmor
fobj
S1 = [(v1, v2), (v2, v3), (v1, v3), (v1. v4)]
Set
Fmor(v)
S2 = [(v1, v2), (v2, v3), (v1, v3)]

FIG. 3

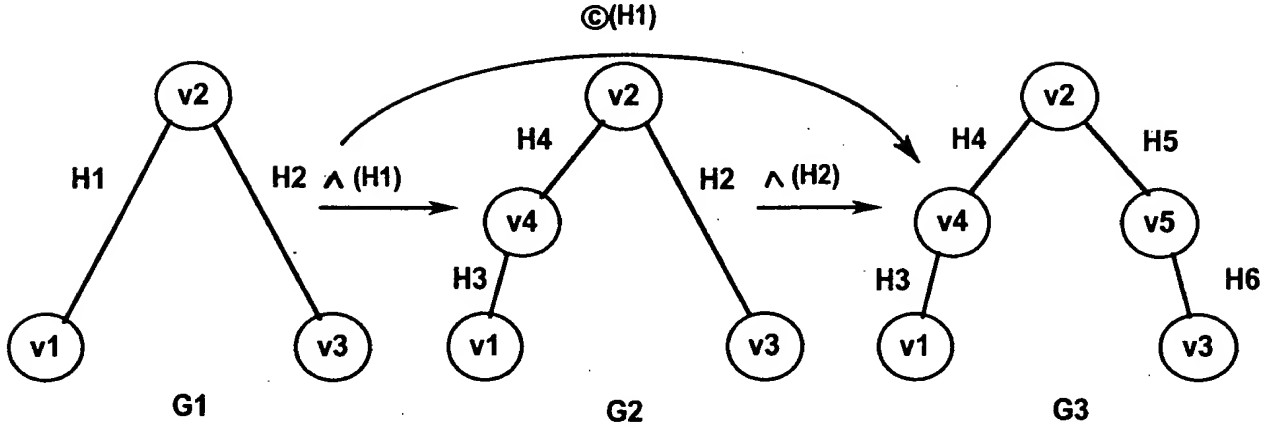


FIG. 8

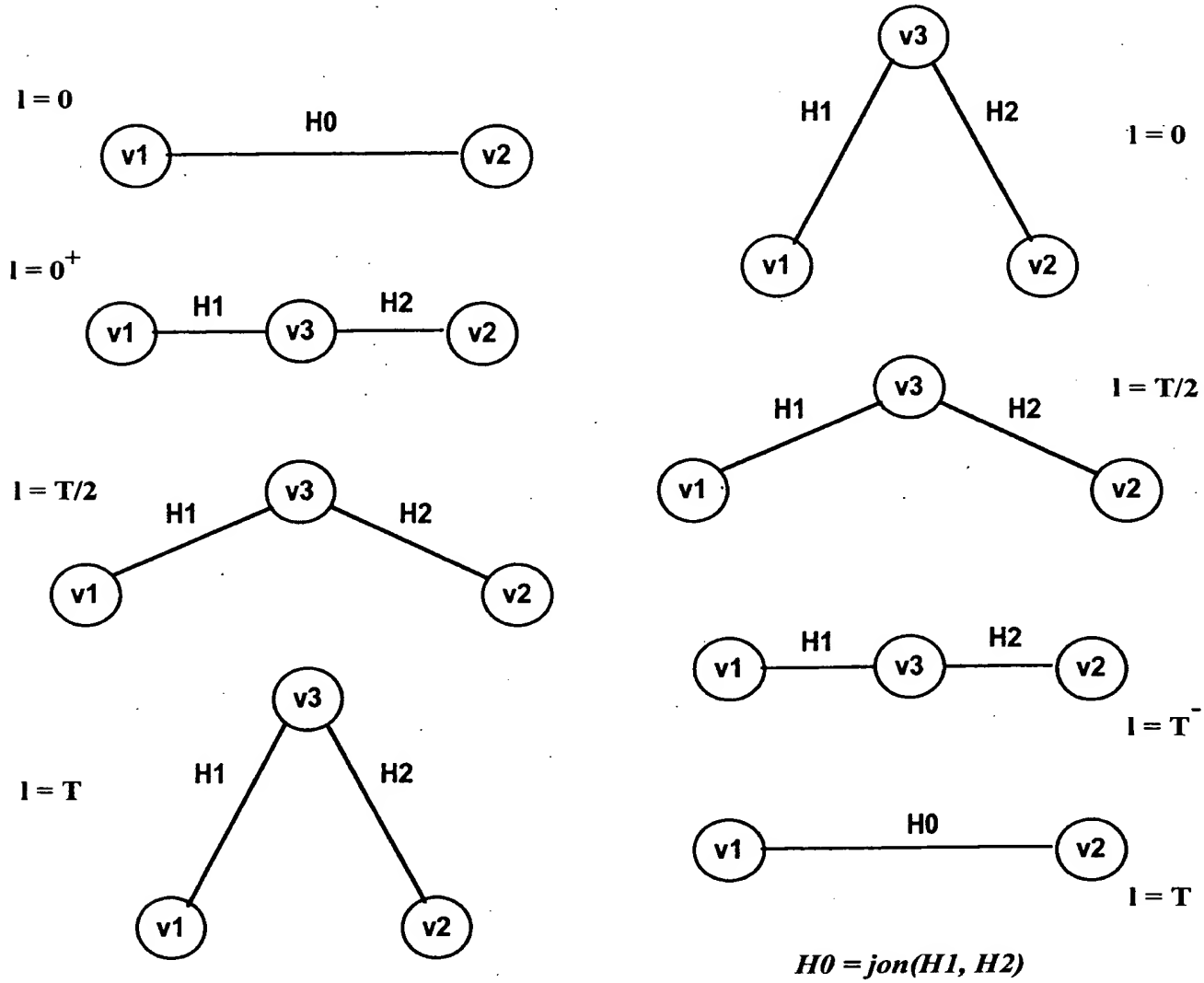


FIG. 9(a)

FIG. 9(b)

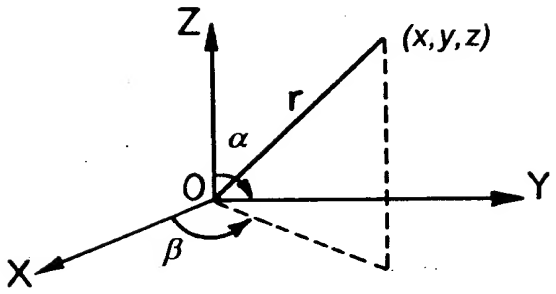

Z
(x,y,z)
r
α
O
Y
X
β

FIG. 10

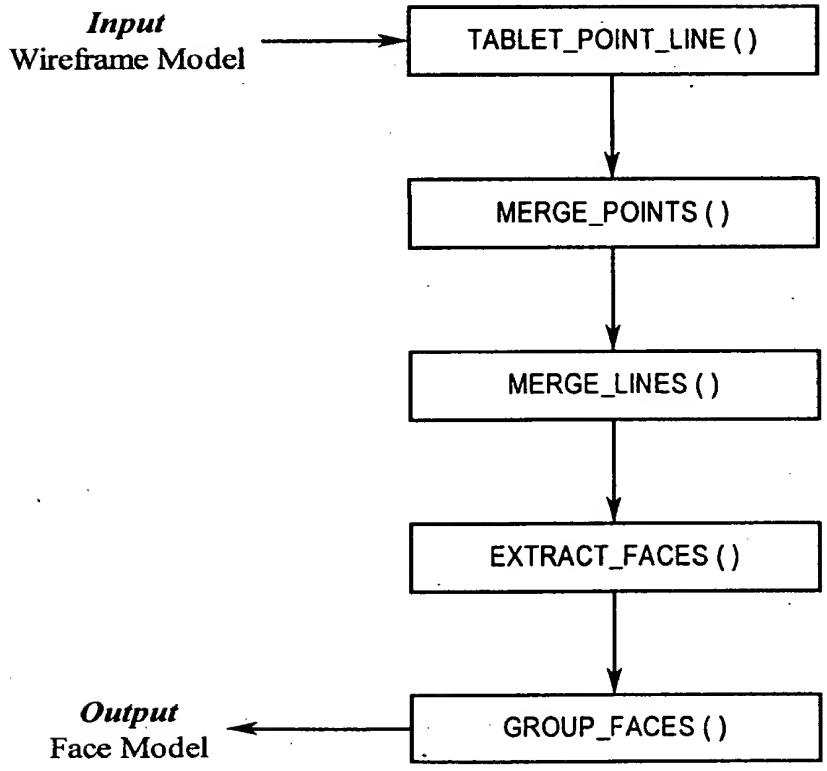

Input
Wireframe Model
TABLET_POINT_LINE ( )
MERGE_POINTS ( )
MERGE_LINES ( )
EXTRACT_FACES ( )
GROUP_FACES ( )
Output
Face Model

FIG. 11

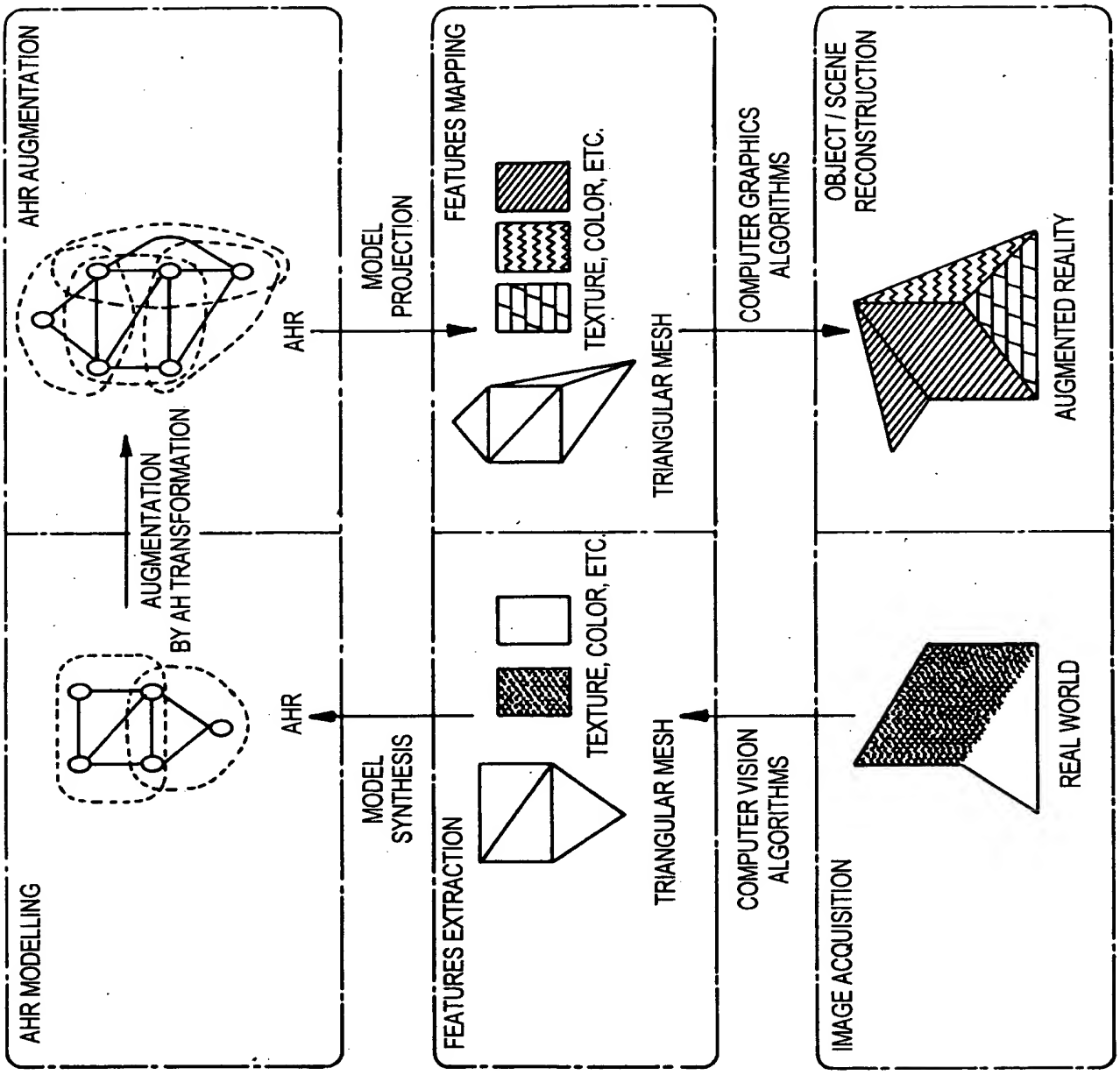

AHR MODELLING
AHR AUGMENTATION
AUGMENTATION BY AH TRANSFORMATION
AHR
MODEL SYNTHESIS
AHR
MODEL PROJECTION
FEATURES EXTRACTION
TEXTURE, COLOR, ETC.
TRIANGULAR MESH
FEATURES MAPPING
TEXTURE, COLOR, ETC.
TRIANGULAR MESH
COMPUTER VISION ALGORITHMS
COMPUTER GRAPHICS ALGORITHMS
IMAGE ACQUISITION
REAL WORLD
OBJECT / SCENE RECONSTRUCTION
AUGMENTED REALITY

FIG. 12

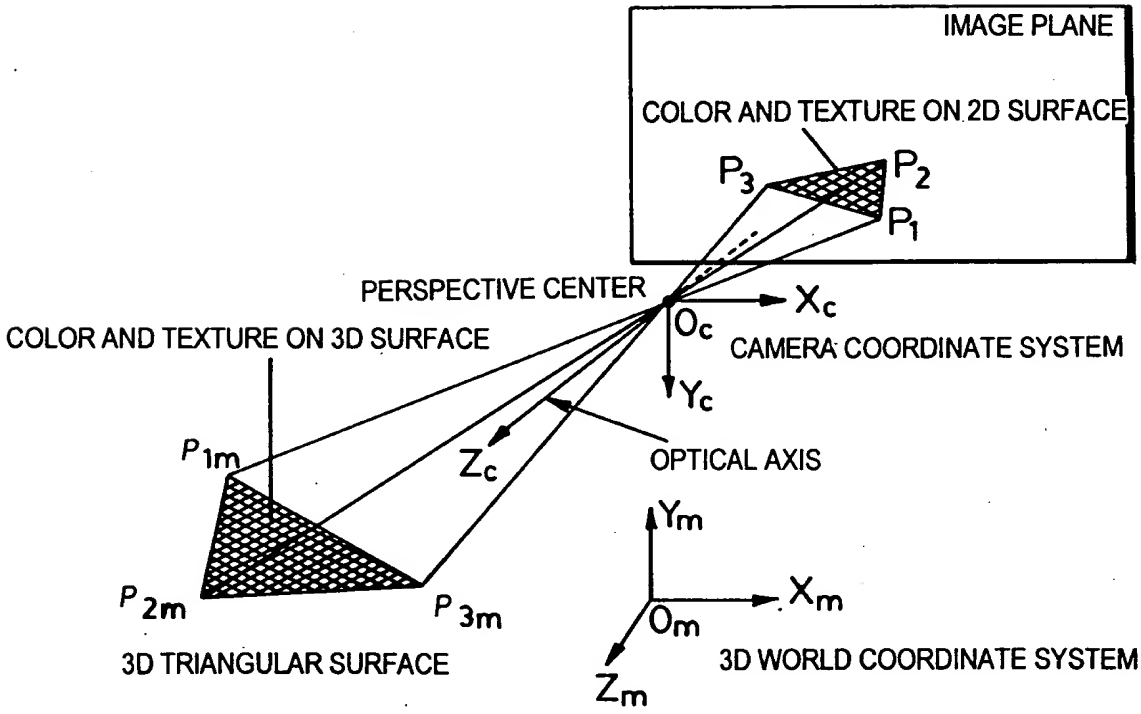


IMAGE PLANE
COLOR AND TEXTURE ON 2D SURFACE
P3
P2
P1
PERSPECTIVE CENTER
Oc
Xc
Yc
Zc
CAMERA COORDINATE SYSTEM
COLOR AND TEXTURE ON 3D SURFACE
OPTICAL AXIS
P1m
P2m
P3m
3D TRIANGULAR SURFACE
Ym
Xm
Om
Zm
3D WORLD COORDINATE SYSTEM

FIG. 13